



Royal Botanic Gardens
and National Herbarium

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LIBRARY
NEWSLETTER OF THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION

Documenting the Conservation Status of Victorian Bryophytes

*Dale Tonkinson and Pep Blanks
Arthur Rylah Institute
Heidelberg, Victoria*

The conservation of bryophytes (mosses and liverworts) has received relatively little attention in Australia, in common with the other non-vascular cryptogams - algae, lichens and fungi. Little if any distributional data exist for most bryophyte species, and our understanding of direct and indirect threats such as habitat modification is at best patchy. The development of a list of rare or threatened bryophytes has therefore been considered impractical. The advent of Victoria's *Flora and Fauna Guarantee Act* (1988) prompted further consideration of the process of listing rare and threatened species.

The development of *A Census of Victorian Bryophytes* (Cropper, et al, 1991) facilitated the first systematic review of the conservation status of all mosses and liverworts. Dr George Scott, an author of the only recent guides to southern Australian bryophytes (Scott and

Stone, 1976; Scott, 1985), was invited to develop an interim list of threatened bryophytes in Victoria. Dr Scott felt it was inappropriate to list the very few species that were sufficiently known in a threat category while many more species were suspected (but not known) to belong in these categories. The resulting interim list consisted of 84 bryophyte taxa, all included in the 'k - poorly known' category that are suspected, but not definitely known, to belong to one of the categories used for rare or threatened plants.

The unsatisfactory nature of this classification has become increasingly evident in the last two years. The rediscovery of *Treubia tasmanica* (previously thought to be extinct in Victoria) in areas threatened by forestry activities has led to considerable effort to conserve the species, a process that would have been assisted by its previously understood status being explicitly indicated by a threat category. The assessment of large areas of the State for Regional

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Editorial

Our National Coordinator, Jeanette, has been off in the wilds of Tasmania having a well-earned holiday! So you'll actually get an editorial this time.

The recommendations from the Endangered Species Advisory Committee regarding the review of the ANPC will be sent to the Federal Environment Minister, Senator the Hon. Robert Hill, shortly. They were also discussed by the ANPC Advisory Committee at its meeting on Friday 13 March in order to develop priorities for action.

The issue of incorporation was also discussed. The Incorporation Committee has met and made a report to the Advisory Committee regarding details of the process. Other possible sources of funds was also an agenda item.

Plans continue for the running of the Conservation Techniques Course to be hosted by Parks and Wildlife Tasmania. The course will probably be held in October this year. There will be more information in the June issue of *Danthonia*, if not in a mail-out sooner. See page 13 of this issue for contact details if you want more information.

Yet more orders are arriving for the Germplasm and Translocation Guidelines, and we hope to have the next lot printed shortly.

In February ANPC had a visit from Christopher Willis, Coordinator of the Southern African Botanical Diversity Network (SABONET). During this time, an agreement was made to set up a Memorandum of Understanding between the

ANPC and SABONET in order that each will promote the other's networks and exchanges between members, exchange articles and publications, and collaborate on activities of mutual interest. For more about SABONET, see page 18 of this issue.

The Network continues to grow, due largely to your support and enthusiasm. We always welcome new ideas, especially with reference to other ways of securing funding, and input to the newsletter about your local activities and people. So keep sending, keep in touch, spread the word and let's continue to flourish!

ANPC Advisory Committee

Prof Henry Nix (chair)

Dr David Aldous

Dr Tony Brown

Mr Stephen Harris

Ms Katrina Jenz

Mr Ed McAlister

Ms Margaret Moore

Dr Bob Parsons

Mr Tim Richmond

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GPO Box 1777

Canberra ACT 2601

AUSTRALIA

Telephone (02) 6250 9450

Fax (02) 6250 9599

Email anpc@anbg.gov.au

<http://www.anbg.gov.au/anpc>

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Forest Agreements has also indicated the need for the most accurate information on the status of bryophyte species to be readily available as a list of rare or threatened species. It was widely agreed that the status of *Treubia tasmanica* should be changed and that it would be opportune to review the status of all 84 'k' species, and any others considered worthy of addition in the light of recent information, rather than establish a precedent for ad hoc changes in response to imminent threats.

In late 1997, a group of seven bryologists met for one and a half days to review the status of over 150 species; two members of the group also had extensive experience in the establishment and review of vascular plant threat status.

The Victorian threat categories and definitions used in the review are those widely used in Australia. ie. 'x - extinct', 'e - endangered', 'v - vulnerable', and 'r - rare', with the additional use of 'k - poorly known'. An additional category ('dd - data deficient') was defined for taxa

whose status is so poorly known that it may be either secure or threatened. The additional Victorian category 'd - depleted' was not applied to bryophytes because of lack of knowledge about the reproductive ecology of nearly all species (see Figure 1).

The table following Figure 1 summarises the results of the review for both mosses and liverworts.

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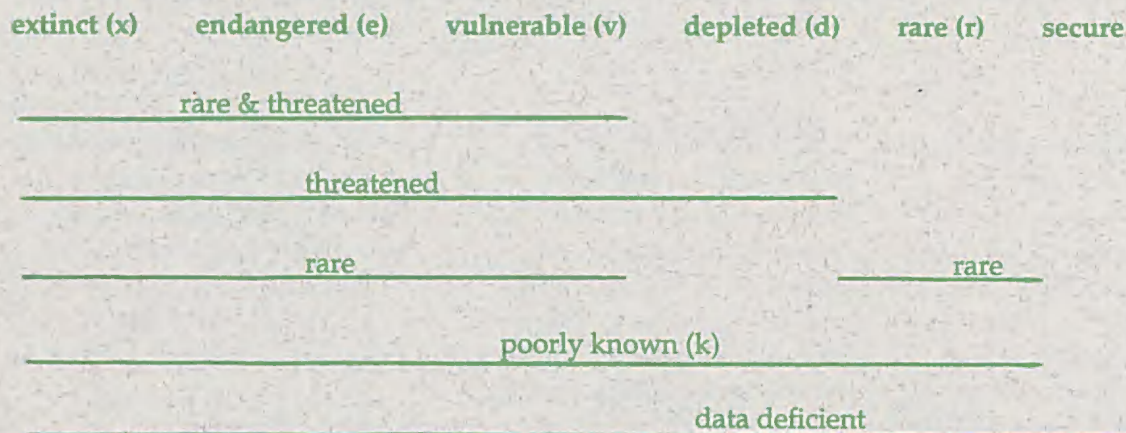


Figure 1. Diagrammatic representation of Victorian Rare or Threatened Species categories.



Dicranoloma menziesii (Tayl.), photographed by Heino Lepp. Taken with permission from Catalogue of Mosses of Australia and its External Territories. Australian Flora and Fauna Series Number 10. 1989. Streimann, H. and Curnow, J. Australian Biological and Resources Study and Australian National Botanic Gardens, Canberra. ACT 2602.

Category	Mosses	Liverworts	Bryophytes
x	1	0	1
e	1	6	7
v	7	7	14
r	16	9	25
k	41	29	70
Taxa	66	51	117
Total Taxa	514	230	744
Total Species	494	229	723
Indigenous Species	491	228	719
Exotic Species	3	1	4

Table 1. Numbers of taxa of mosses and liverworts in each threat category and summary statistics for the Victorian bryophyte flora

The table indicates that some 22% of liverworts are thought to be rare or threatened, whereas less than 13% of mosses are similarly classified. This may reflect a better understanding of the threats operating in wet forest environments, where a greater proportion of the state's liverworts are represented, compared with drier ecosystems in which mosses are relatively better represented. Overall, 16% of bryophytes are thought to be rare or threatened, which compares with some 43% of the Victorian vascular flora; a remarkable difference which may be attributable to the large variation in our knowledge of the two groups, the more efficient dispersal ability of spore-bearing plants compared with seed plants, and perhaps also the greater representation of bryophyte-rich habitats within the reserve system.

It is expected that the review will promote the inclusion of bryophytes in conservation planning in Victoria and prompt field workers to increase the information base not only for these listed species (especially 'k' species) but for all bryophytes and their habitats.

The results of the review have now been incorporated into the Flora Information System maintained by the Department of Natural Resources and Environment in Victoria. The information is now available to all workers undertaking conservation assessments in the State.

In association with the Fifth Australasian Bryophyte Workshop to be held in the Grampians in July 1998, a concerted effort will be made to document the bryophyte flora of this diverse region.

Note: Any readers interested in the Workshop should contact David Meagher, 18 Banool Road, Surrey Hills, Victoria 3127.

Or send an email to: david.meagher@nre.vic.gov.au

References:

Cropper, S.C., Tonkinson, D.A. and Scott, G.A.M.S. (1991). *A Census of Victorian Bryophytes*. National Parks and Wildlife Division, Department of Conservation and Environment, Melbourne.

Scott, G.A.M.S. (1985). Southern Australian Liverworts. *Australian Flora and Fauna Series No. 2*, Australian Government Publishing Service, Canberra.

Scott, G.A.M.S. and Stone, I.G. (1976). *Mosses of Southern Australia*. Academic Press, London.

Update on *Epacris hamiltonii* (Maiden & Betche)

Margaret Turton, Sydney Zone,
NSW National Parks & Wildlife
Service

Since the last article in *Danthonia* on this species (September 1995), much progress has been made in many areas: in extension of range, research on fire responses and the assessment of threatening factors.

Background

Epacris hamiltonii was first discovered in January 1900 at Blackheath in the Blue Mountains by Mr A.A. Hamilton, a gardener at Centennial Park, Sydney. The species was described by Maiden and Betche and named in Mr Hamilton's honour in 1900.

The majority of the populations occur within the Blue Mountains National Park. Previously only known from one population (an estimated 50 plants), *E. hamiltonii* has now been discovered within three creek catchments (an estimated 4000 plants) in the upper Blue Mountains. The species is clonal so population estimates are based on the number of stems rather than genetic individuals.

The species appears to require a very specific habitat, being found on or adjacent to Narrabeen Sandstone cliffs alongside perennial creeks. These locations are adjacent to wet gully or swamp vegetation and associated with an altitude range of 810-940 m ASL. These sites appear to have perennial moisture regimes which

support the survival of *E. hamiltonii* in these areas.

Fire Ecology

Further monitoring of the seedlings that germinated as a result of fires in 1994 has revealed that the growth rates of seedlings have been relatively slow, with a seedling height maximum of 11cm after 3 years growth. Growth rates vary between site locations and their accompanying environmental conditions. To reduce long-term fire induced declines in populations, it is essential to determine the optimal fire regime required for *E. hamiltonii*. Plants that resprouted after being burnt in the January 1994 fires will now need to mature, flower and replenish the seed bank (soil and canopy).

It has been found that *E. hamiltonii* has the following strategies to cope with fire events:

- Adult plants are capable of resprouting from the rootstock and from basal suckers after fire, although some individuals are killed.
- The resprouting plants begin to contribute to the seedbank almost three years after a fire event.
- A viable seed store is maintained. The seed has a positive heat response in a fire, which promotes germination.

(Continued on page 6)



Epacris hamiltonii, drawn by Margaret Turton, NSW NPWS

Threats

There are various threats with the potential to harm the populations of *E. hamiltonii* and its habitat. Each threat is discussed separately.

Inappropriate fire regimes

Habitats and the natural processes occurring within them need to be maintained in as natural a balance as is possible. Inappropriate fire regimes can alter this balance, leading to changes in species presence and abundance, population composition and structure, as well as affecting a myriad of associated factors such as pollinators and mycorrhizal fungi, all of which are essential to the health of the plant and its habitat.

Inappropriate fire regimes have the potential to make *Epacris hamiltonii* extinct at the local level. Seedlings should be allowed to develop rootstocks capable of withstanding fire events, before exposure to another fire. This will ensure that any individuals killed by the fire will be replaced by new recruits.

Changes in water regimes

E. hamiltonii favours moist sheltered gullies under overhangs, and is dependent upon water seepage through the sandstone cliffs. As these areas are water-fed by cliff seepages from the hanging swamps above, they are perennial even in short dry periods. Due to this dependence a prolonged drought event, with accompanying low rainfall and high temperatures, will reduce or stop discharge from swamps (Holland et al,

1992) and therefore has the potential to affect *E. hamiltonii* and other wet gully species. Groundwater aquifer extraction could also affect these swamps and subsequently this species and its habitat.

Increased nutrient levels

The subsequent nutrient enrichment of water sources due to increased urbanisation of the Blue Mountains Plateau can affect *E. hamiltonii* directly or indirectly by encouraging weed growth and establishment.

Sources of ground and surface water contamination such as sewerage and storm water runoff also pose potential threats.

Weed Invasion

Weed species are becoming invasive in some areas, especially in Katoomba Creek and Govetts Creek where Scotch Broom (*Cytisus scoparius*), Blackberry (*Rubus fruticosus*) and Ivy (*Hedera helix*) are threatening populations of *E. hamiltonii*. These species thrive in the moist creeklines where *E. hamiltonii* grows.

Note: All work on this species has been funded by Environment Australia and the NSW National Parks & Wildlife Service.

Recovery Plan

The revised *Epacris hamiltonii* Species Recovery Plan is now in its final stages, and will be available for public comment in the near future.

Contact Maria Matthes, Technical Officer, NSW National Parks & Wildlife Service, Hurstville.

Phone: 02 9585-6841.

Reference:

Holland W. N., Benson D. H. and McCrae H. D. (1992). Spatial and Temporal Variation in a Perched Headwater Valley in the Blue Mountains: Geology, Geomorphology, Vegetation, Soils and Hydrology. *Proceedings of the Linnaean Society*, 113:4.

Workshop

Minerals Council of Australia

26-30 October 1998:

Melbourne, Victoria, Australia. The 23rd annual Environmental Workshop, the premier environmental conference for the minerals industry.

Possible topics include sustainable development, environmentally responsible culture, community partnership, risk management, integrated environmental management, reporting and auditing.

There will be a formal poster session, a student research award and a trade exhibition. Sponsorship packages are available.

Contact:

Ms Nedra Burns, Minerals Council of Australia, PO Box 363, Dickson ACT 2602.

Phone: 02 6279 3634;

Fax: 02 6279 3699.



**MINERALS
COUNCIL**
OF AUSTRALIA

The Biodiversity Conservation Policy of the Australian National Botanic Gardens

Ben Wallace, Director Living Collections, Australian National Botanic Gardens

The Australian National Botanic Gardens (ANBG) has had a strong interest in and commitment to conservation extending beyond the last two decades.

Perhaps the primary factor in this is the ANBG's exclusive thematic focus on the Australian flora, and the attraction this has had for people with a passionate dedication to Australian plants and the bush. In turn, such people not only build up a knowledge of the plants and their attributes, but also as a result of searching them out in the wild, studying the literature and communicating with others of like interest, become aware of whether they are common or rare. Actions by such individuals and, in time, concerted organised activity originating from them, can give rise to major conservation outcomes such as the Australian Network for Plant Conservation.

Indeed, in this case we owe tribute to a few such people, particularly Mark Richardson, Geoff Butler and Lyn Meredith, for the genesis of this organisation from within the ANBG. Along the way, they also have contributed to the forming of ANBG policy.



The Policy

The ANBG has now crystallised a formal policy outlining its philosophy, attitude and interests in biodiversity conservation. The paper begins with an introduction and background relating to the development of the conservation movement worldwide with particular reference to the United Nations Convention on Biological Diversity. This points out the opportunity and indeed mandates the responsibility of botanic gardens to be active agents in conservation.

Next, the legal and organisational basis for the policy is outlined and a network of co-operating organisations defined.

The ANBG mission is to grow, study and promote Australia's flora. In carrying out this mission the ANBG has nine principal aims as enunciated in its Plan of Management, six of which directly relate to conservation of the Australian flora. These are:

- to promote the protection, conservation and wise use of Australian flora

- to foster understanding of Australia's plant heritage and its environmental and cultural values
- to conduct and encourage research on the collections
- to provide an information resource for government, industry, science and the community
- to provide a national focus for, and co-operate with other organisations in, matters concerning botanic gardens and herbaria
- to display the living collections in an educationally useful and attractive setting that enables people to enjoy and appreciate the recreational and horticultural values of botanic gardens.

The conservation objectives which are derived from these aims cover the influencing of people's opinions; providing national and international focus and leadership in conservation; providing an information resource, and horticultural & biodiversity research; developing an ex situ living collection of ROTAP listed taxa for use in recovery plans, education programs, and gene banking; contributing to species recovery and in situ conservation activity; promoting involvement of indigenous people in environment management and particularly in plant conservation; assisting the development of a network of Australian botanic gardens and providing support for kindred institutions in conservation and sustainability matters.

The strategies which are set out to implement these objectives are many and varied: the ANBG will have many,

though not all 'on the boil' at any one time, depending on resources, expertise and interest. It must also be borne in mind that the policy will evolve and be modified over time as a living document as a result of experience and in relation to changing times and ideas.

One particular aspect of the policy I consider important is its broadened, encompassing approach to biodiversity conservation. Generally, due to their considerable iconic value, focus, including the allocating of resources for action, tends to be on those rare, threatened and particularly endangered species which are relatively few and often unimportant in terms of their ecological impact, potential genebank contribution and potential use to humanity. On the other hand, conservation of communities, ecosystems, biomes and landscapes, and sustainable management of the environment, stand to achieve highly significant outcomes in terms of the planet, not to mention the great bulk of individual species conserved at the same time.

Note: The Australian National Botanic Gardens Biodiversity Conservation Policy will shortly be available as a published document from:

The Administration Officer
Australian National Botanic Gardens
GPO Box 1777
Canberra ACT 2601
Australia.
Phone: 02 6250 9450

Conservation Action Plans

Environment ACT has prepared Action Plans for the conservation of two species of flora and one ecological community which have now been declared threatened under the provisions of the *ACT Nature Conservation Act 1980*.

The community is Natural Temperate Grassland.

The species of flora are *Gentiana baeuerlenii*, a subalpine herb, and *Prasophyllum petilum*, a leek orchid.

Copies of the plans are available.

For inspection, go to the Environment ACT Visitor Centre, Macarthur House, Level 2 Annexe, 12 Wattle St, Lyneham ACT.

To collect, go to Wildlife Research and Monitoring, O'Connor Depot, Cnr Dryandra St and Belconnen Way, O'Connor, ACT.

Telephone/fax inquiries to:
John Baker,

Phone: 02 6207 2124;

Fax: 02 6207 2122.

Home Page:

<http://www.act.gov.au/envirom>



Electronic Addresses

Threatened Species Lists

International

IUCN Red Lists:

www.wcmc.org.uk/species/data/

Federal

The Endangered Species Protection Act and ANZECC lists:

www.biodiversity.environment.gov.au/plants/threaten/list.htm

State

ACT:

www.act.gov.au/envirom/threatened.html

NSW:

www.npws.nsw.gov.au/wildlife/threaten.htm

NT:

www.nt.gov.au/paw/

SA:

www.denr.sa.gov.au/

TAS:

www.delmtas.gov.au/esl/

VIC:

www.nre.vic.gov.au/plntanml/native/actstats/actstats.htm

WA:

www.calm.wa.gov.au/

Qld:

www.env.qld.gov.au/environment/plant/

Workshop

Development in Native Grasslands - Resolving the Conflict

Tuesday 26 May 1998:
CSIRO Wildlife & Ecology,
Barton Highway, Gungahlin,
ACT.

The workshop will be hosted by Friends of Grasslands with assistance from CSIRO Wildlife & Ecology.

Native grasslands hold value for many people: farmers, urban and rural developers, governments and environmentalists. Like the people, these values differ and in the past those differences have generated conflict, often magnified because of the way we address development proposals. As organisations and individuals we often have to deal with these situations in a "knee jerk" or unplanned way. Worse still is the need to take sides in an attempt to protect our values and interests. This is a recipe for mistrust and entrenched positions and it increases the level of conflict we experience.

Friends of Grasslands would like to see stakeholders share their values in an environment where they can explore compromises that provide good outcomes for all of us. To help this along we are hosting a one day workshop of panel forums. Representatives of stakeholders will give short presentations about past and future grassland developments. Audience discussion and questions will follow in each session. The final panel session

will develop strategies to reduce or avoid future conflicts. This is a great opportunity to have your say.

So please come along to meet and talk with other stakeholders.

For more information and to register your interest please contact either:

Art Langston,
Phone: 02 6242 1632;
Fax: 02 6241 4020;
Email: Art.langston@dwe.csiro.au,
or Geoff Robertson,
Phone: 02 6241 4065.

Meetings

Society for Conservation Biology International Meeting

13-16 July 1998: Macquarie University, Sydney, Australia.

The 12th annual and third international meeting of the SCB (covering fauna and flora) will include two plenary sessions, 18 symposia, four workshops and open sessions for posters and spoken papers.

Amongst the symposium convenors is Dr David Given, Chair of the IUCN Species Survival Commission's Plant Conservation Committee, whose topic is "Conservation issues of invasive species in Australasia and the South Pacific". Another is Dr Andrew Young from CSIRO, whose topic is "Genetics, demography and viability of fragmented populations". There is also a symposium on "Modern horticultural technology

applied to rare plant conservation", to be convened by Kimberley McCue from Missouri Botanic Gardens.

There will be pre- and post-conference tours, to north-east Queensland, western Victoria, the Warrumbungles and other areas. For full itineraries contact Tony Lee, Australis Nature Tours, Victoria. Email: AUSTRALIS@compuserve.com or fax to +61 3 9888 6082.

Registration information is available at the website <http://www.bio.mq.edu.au/consbio>.

The deadlines are 30 April for early registration and 31 May, or later with a surcharge. There are a range of costs.

For further information contact:

George McKay, School of Biological Sciences, Macquarie University, Sydney NSW 2109.
Email: george.mckay@mq.edu.au

Genetics Society of Australia

8-12 July 1998: Sydney University, Sydney, Australia.

For information see:
<http://gsa.angis.org.au/Meetings/Sydney-1998/>

Additional

12 July 1998: Sydney University, Sydney, Australia.

Joint session between the Society for Conservation Biology and the Genetics Society of Australia.

Contact: Richard Frankham, Macquarie University.
Email: rfrankha@rna.bio.mq.edu.au.

ROTAPs in the South West Slopes of NSW

Geoff Burrows, Charles Sturt University

This brief analysis of Rare or Threatened Australian Plants (ROTAPs) in the South West Slopes (SWS) is chiefly based on an analysis of information in *Rare or Threatened Australian Plants* (1996) by Briggs and Leigh and on a September 1997 ROTAP update supplied by Lyn Meredith of Environment Australia in Canberra.

In the ROTAP book, mainland NSW is divided into 11 regions (regions 48 to 58. See Table 1) with the SWS listed as region 52. There are 19 species listed for the SWS in the 1996 edition and 21 species in the 1997 update (Table 2). The book lists those species that are presumed extinct, endangered, vulnerable, rare and poorly known.

Two pieces of legislation that apply to the SWS are the Commonwealth's Endangered Species Protection Act (ESPA) (1992) and the NSW Government's Threatened Species Conservation Act (TSCA) (1995) which only cover species which are presumed extinct, endangered or vulnerable. If the rare and poorly known ROTAP species are ignored there is good correlation between the ROTAP listing and the ESPA and the TSCA lists.

Of the 21 SWS ROTAPs one species is known from only one collection while the geographic range is less than 100 km for five species and greater than 100 km for 15 species. This indicates that most of the SWS ROTAPs have a reasonably wide distribution, rather than being endemic to a small area.

Of these 21 species four are classified as endangered (E), nine as vulnerable (V), three as rare (R) and five as poorly known (K).

While 12 of the 21 species are represented in at least one conservation reserve within Australia, only two are represented in at least one conservation reserve in the SWS. These two species are *Pterostylis petrosa* recorded for The Rock Nature Reserve and *Senecio garlandii* recorded for The Rock, Ulandra and Tabletop Nature Reserves. The small number of ROTAPs conserved in the SWS is not surprising given the small area of land in the SWS reserve system. Of the 14 botanical subdivisions in NSW the SWS has the second lowest area (0.2% or approximately 7000 ha) of reserved land in the state. In addition the SWS has the lowest number of recorded ROTAPs (Table 1).

Note that of the 21 species, six are presumed extinct in the SWS and one, *Aphanes pumila*, is recorded from a single location and has a complicated taxonomy. Four are not recorded for NSW in the *Flora of NSW*, and of these, three are presumed extinct in the SWS and the other is *A. pumila*.

Table 1. Number of ROTAPs recorded for the botanical regions of NSW

ROTAP region	Region name	Total ROTAP taxa
48	NFWP, SFWP	30
49	NWP, SWP	35
50	NWS	35
51	CWS	54
52	SWS	19
53	NT	35
54	CT	128
55	ST	154
56	NC	237
57	CC	152
58	SC	73

Table 2. ROTAPs of the SWS

Family	Genus	Species	Risk
Asteraceae	Ammobium	craspedioides	V
Asteraceae	Brachyscome	gracilis	R
Asteraceae	Brachyscome	muelleroides	V
Asteraceae	Senecio	garlandii	V
Asteraceae	Stemmacantha	australis	V
Asteraceae	Taraxacum	aristum	R
Cabombaceae	Brasenia	schreberi	R
Fabaceae	Psoralea	parva	E
Fabaceae	Swainsona	murrayana	V
Fabaceae	Swainsona	recta	E
Goodeniaceae	Goodenia	macbarronii	V
Mimosaceae	Acacia	phasmoides	V
Orchidaceae	Caladenia	concolor	V
Orchidaceae	Caladenia	rosella	E
Orchidaceae	Diuris	tricolor	K
Orchidaceae	Pterostylis	petrosa	K
Poaceae	Amphibromus	fluitans	V
Poaceae	Amphibromus	pithogastrus	K
Proteaceae	Grevillea	iaspicula	E
Rosaceae	Aphanes	pumila	K
Scrophulariaceae	Gratiola	pumilo	K

Of the other 14 species I have recorded three (*Ammobium craspedioides*, *Senecio garlandii* and *Diuris tricolor*) in my studies of remnant vegetation in the SWS. The first two species are listed as 'vulnerable' and the last as 'poorly known'.

Ammobium craspedioides is recorded in the *Flora of NSW* as "rare, confined to the Yass district", but I have subsequently found a small population in Livingstone State Forest (approximately 30 km south of Wagga) and presumably there may be further populations in the intervening distance of over 100 km.

Senecio garlandii (Woolly Ragwort) is probably the most easily observed ROTAP in the SWS as it is a conspicuous part of the flora of the upper part of The Rock Nature Reserve and

is sometimes mistakenly considered a weed. Previously *S. garlandii* was known from only six or seven sites and only one of these, The Rock Nature Reserve, was a conservation area. I have recorded it from a further three sites of which two are conservation areas, and have confirmed its apparent habitat preference for the upper scree slopes of steep sided hills and mountains in the area.

I have recorded *Diuris tricolor* at several sites in the White Cypress Pine country west of Wagga and while it is never abundant the 'poorly known' listing may not be appropriate. I have also found *Brachyscome papillosa* in the western part of the SWS. This species is listed as vulnerable in both Acts and does not appear in the ROTAP list.

In summary, the SWS have:

- i) been extensively disturbed;
- ii) little remnant vegetation;
- iii) a very low area of land dedicated to flora conservation, and
- iv) a small number of recorded ROTAP species. This indicates that a combination of extensive and intensive land disturbance, a small percentage of remnant revegetation, of which little is in conservation reserves, and limited botanical research has probably meant that many ROTAP-type species have been lost from the SWS without ever having been recorded.

Acknowledgments

I thank Lyn Meredith from Environment Australia for the SWS ROTAP listing and other information and Roger Good of NSW NP&WS for advice on NSW related flora legislation.

(Continued page 12)

References:

Harden, G. J. (1990). *Flora of NSW*. New South Wales University Press, Kensington, NSW Australia 2033.

Briggs, J. D. and Leigh, J. H. (1996). *Rare or Threatened Australian Plants*. CSIRO Australia.

September 1997 ROTAP update supplied by Lyn Meredith of Environment Australia in Canberra.

New Research Project

Population Genetics, Ecology and Conservation of the Rare and Endangered Species *Grevillea iaspicula* McGillivray and *Gentiana wingecarribiensis* L. Adams

Susan Hoebee, PhD student, Centre for Plant Biodiversity Research and the Australian National University

Objectives

To determine whether genetic processes such as genetic drift and inbreeding affect the viability of *Grevillea iaspicula* and *Gentiana wingecarribiensis* populations.

Specifically, to examine the interaction of genetic and demographic processes on population viability and to determine under what population and/or species conditions (ie. size, isolation, life-history) genetic processes are important relative to environmental or demographic factors.

Importance

The results of this study will contribute to our general understanding of conditions where genetic processes are likely to affect population viabilities and extinction probabilities of endangered plant species. This is important for effective management of

these species for conservation. The results will also provide general guidelines for the management of other endangered species with life-history traits similar to those of *Grevillea iaspicula* and *Gentiana wingecarribiensis*.

Expected Outcomes

- Determine levels of genetic diversity and inbreeding for selected populations of *Grevillea iaspicula* and *Gentiana wingecarribiensis*.
- Examine demographic parameters for populations of *Grevillea iaspicula* and *Gentiana wingecarribiensis*.
- Development of computer simulation models of population viability for both *Grevillea iaspicula* and *Gentiana wingecarribiensis* incorporating genetic and demographic processes.
- To assist with recovery planning via collaboration with recovery team (for both species).

Susan's supervisors are Dr Andrew Young from the Centre for Plant Biodiversity Research/CSIRO, and Professor Peter Kanowski from the School of Resource Management and Environmental Science, Australian National University.

Note: These species have a ROTAP code of 2E. This indicates that the two taxa have distributions over areas of less than 100 km, and are threatened with extinction in 10-20 years if the current situation regarding land use in those areas continues. Ed.



Grevillea iaspicula, drawn by Diana Boyer. From the collections of the Australian National Botanic Gardens.

Courses

ANPC Conservation Techniques Course

October 1998: Parks and Wildlife Tasmania are to host the second Conservation Techniques Course which is to be held in Hobart.

More information will be available in the June issue of *Danthonia*.

For more information, please contact: Andrew Smith, Community Partnerships Section, Parks and Wildlife Service, PO Box 44A, Hobart Tasmania..

Phone: 03 6233 2185;

Fax: 03 5233 8308;

Email:

andrews@delm.tas.gov.au

Postgraduate Environmental Law

Australian Centre for Environmental Law (ACEL), Australian National University, Canberra: Study Environmental Law part-time in eight modules over two years, with the addition of four extra modules for a research paper for the Masters.

Useful for lawyers and non-lawyers (with a three day bridging course) such as consultants and managers.

Contact: Maureen Lawrentin at ACEL-ANU;

Phone: 02 6249 3487;

Fax: 02 6249 4899;

Website: <http://law.anu.edu.au/centres/accel/HomePage.html>

Trade and the Environment

27-28 April 1998: location as above.

An ACEL Short Course looking how trade laws affect environmental protection measures, the Convention on Biological Diversity, phytosanitary standards, and potential for international conflict.

Contact: ACEL - Faculty of Law, Australian National University, Canberra ACT.

Phone: 02 6249 3487/3397;

Fax: 02 6249 4899.

Environmental Responsibilities of Local Government

12-13 May 1998: location as above.

An ACEL Short Course with Dr Gerry Bates, author of *Environmental Law in Australia*.

The course reviews the extent to which environment protection is increasingly becoming the responsibility of local government and examines the nature of that responsibility in the context of legal obligations and policy requirements. \$595.

Contact: as above.

Environmental Decision-making for Public Servants

15 May 1998: as above.

An ACEL Short Course with Dr Gerry Bates, examining the legal requirements for making decisions which impact on the use of natural resources and the environment.

It provides a practical foundation for public environmental decision-making based on both statutory and judicial standards. \$370.

Contact: as above.

Conference

Caring for the Land

1 May 1998: Camperdown, Sydney NSW 2050.

This conference will be hosted by the Environmental Defender's Office (EDO), and aims to discuss the NSW *Native Vegetation Conservation Act* 1997.

Speakers include the Hon. Richard Amery, State Minister for Agriculture, Land and Water Conservation; Andrew Campbell, Assistant Secretary Sustainable Landscapes Branch, Environment Australia; Sue Salvin, Director, Conservation and Resource Management, NSW Farmers' Association; and Associate Professor David Goldney, Charles Sturt University.

Registration: Places are limited so register early. Refunds of 50% for cancellations before 24 April.

Subsidy: Landholders in the Western Division may be eligible for a West 2000 training subsidy. Please contact 1800 068 072 before registering.

For more information, contact Tessa Bull or Julie Foreman, EDO, Sydney.

Phone: 02 9262 6989 or

1800 626 239;

Fax: 02 9262 6998;

Email: edo@magna.com.au

Web: <http://www.edo.org>

Important News

Reform of Commonwealth Environment Legislation

The Commonwealth Minister for the Environment, Senator the Hon. Robert Hill, recently issued a Consultation Paper titled *Reform of Commonwealth Environment Legislation*.

The paper looks at reforms of environmental legislation, gives the objectives of the reviews of laws, and describes the proposed Environment Protection and Biodiversity Acts and the reform of heritage legislation.

The final date for submissions is 23 March 1998, which will have passed by the time you receive this issue of *Danthonia*, but you may wish to check whether late submissions will be accepted.

Copies are available from:
Community Information Unit,
Dept of the Environment, GPO
Box 787, Canberra ACT 2601.
Phone: 1800 803 772 (toll free)
or 02 6274 1970.

Web:
<http://www.environment.gov.au/net/legrev.html>

Comments, accompanied by a copy on a PC or Mac disc if possible, should be sent to:
Mr Wayne Fletcher, Director,
Legislation Reform Task Force,
Department of the Environment,
GPO Box 787,
Canberra ACT 2601.
Fax: 02 6274 1878.
Email: wayne.fletcher@ea.gov.au

New Network

Taken with permission from On the Brink!, newsletter of the Endangered Species Program

Recently the Australia and New Zealand Environment and Conservation Council (ANZECC) convened the Endangered Ecological Community Network. It is to assist with the process of listing Endangered Ecological Communities under the Commonwealth *Endangered Species Protection Act 1992*.

The Network will maintain the list of Endangered Australian Ecological Communities, develop and refine the criteria and definition for these communities, provide comments and advice on State and Territory concerns, and assist the Endangered Species Scientific Subcommittee.

It is currently developing a list of endangered ecological communities and refining listing criteria.

This process links to the Commonwealth lists as the Endangered Species Scientific Subcommittee has to refer to ANZECC lists when advising the Minister regarding the listing of species, subspecies or ecological communities on the schedules to the Act.

New Directory

The Australian Minerals and Energy Environment Foundation (AMEEF), supported by the Supervising Scientist Group of Environment Australia, is developing a comprehensive directory of environmental management

and science capabilities relevant to the Australian minerals and energy industry.

AMEEF hopes the directory will encourage networking and publicise the wide range of Australian environmental management activities.

It will be a searchable electronic database on the Internet, complementing other databases such as EnviroNET.

To find out more, contact AMEEF.

Phone: 03 9679 9911;

Fax: 03 9679 9900;

Email: ameef@amira.com.au

Web: www.ameef.com.au

Conservation Strategy

December 17th 1997 saw the launch of *Where the Forest Meets the Sea*, a conservation strategy for the Great Ocean Road Region of Victoria.

The report, written by Dr Geoff Mosley, was funded by the Geelong Environment Council, the Australian Conservation Foundation and the Great Ocean Road Committee. It was launched by Mr Ian Smith, MLA, and Dr Mosley was a speaker.

Its aim is to increase recognition of, and protect from development, the important ecological and scenic values of the Great Ocean Road, and to ensure that developments are contained in specified areas.

Copies are available for \$10.00 plus 50c postage from: Geelong Environment Council, PO Box 4045, Geelong Victoria 3220.

Phone: 03 5243 6340;

Fax: 03 5222 4775.

NEROC study maps key habitat and faunal sites in Melbourne's north-east

Quotes taken with permission from Indigenotes Volume 10, Number 10, 1997 (Indigenous Flora and Fauna Association)

Significant habitat and faunal sites on Melbourne's north-east have been mapped and categorised in a study conducted by 12 metropolitan councils.

The study was financed by the North East Region Organisation of Councils (NEROC) and the Department of Natural Resources and Environment, and covers 1000 square kilometres. It lists flora and fauna across the region by location and environmental significance.

The study area "includes five sites of National faunal significance; 44 of State faunal significance, and over 50 of Regional significance. In addition, the study examines 23 sites of very high, 36 of high and 45 of medium habitat significance. For each site, threatening processes and recommended conservation measures are outlined."

"It is anticipated that the NEROC study will be used as a conservation reference document and its findings will be incorporated into the new planning schemes currently being prepared by Victorian municipalities." eg. Nillumbik Shire. The Nillumbik Council's "Environment and Land Use Strategies section...facilitated the completion of the project in 1997."

The Acting Manager of Environment and Land Use Strategies for Nillumbik, Michael Bismire, said that: "The study is a fantastic resource that will be used widely by land owners, government agencies, students and schools, Landcare, Friends and environmental groups, Council staff and residents...It is anticipated that Councils and schools will use the study as a documentary resource for local flora and fauna and use this information for the development of projects."

All inquiries to Nillumbik Shire Council's Environment and Land Use Strategies section.

Phone: 03 9433 3111.

Copies are on sale from the Shire offices, Civic Drive, Greensborough Vic 3088.

Volume 1, "Introduction and Overview" (soft cover A4 book), CD-ROM and 2 coded maps, \$90.00.

Complete study on CD only, \$30.00.

Friends of Grasslands

Geoff Robertson

Following a lull in early 1997 and a questioning of its role and organisation, Friends of Grasslands formed a new and energetic committee. Its prime focus is to promote an understanding of native grasslands, and strategies to conserve and restore them.

Objectives:

1) visiting grassland sites to study structure, conditions, plant communities, weed invasion, legal status, management plans, or potential management strategies;

2) visiting sites where land care groups are actively involved, a group may be starting up, a farmer or individual wants advice or help, to exchange ideas, provide advice or give help;

3) carrying out joint projects, such as developing a management plan with the Christian Tent of Meeting group for the grassland at the St. Mark's National Theological Centre in Barton to show a natural native grassland at its best and to educate the wider community in grasslands values;

4) organising public fora on grassland issues, such as the 26 May workshop (see Page 9);

5) slides/talks/general meetings to share information and discuss issues;

6) plant identification, plant propagation, displays;

7) public education and lobbying;

8) communications such as a quarterly newsletter and development of a website; and

9) networking with like-minded groups and stakeholders.

Friends of Grasslands draws most of its membership from Canberra and surrounding NSW but also has members further afield. It hopes to extend its area of interest to grasslands sites in the Monaro and to areas somewhat north and west of Canberra. It is attempting to build stronger contacts with grasslands groups interstate.

For information, contact Friends of Grasslands, PO Box 987, Civic Square ACT 2608.

Phone: Paul Hodgkinson on 02 6278 3231; or

Geoff Robertson on 02 6252 5410 (bh); 02 6241 4065 (ah/fax).

Regional Groups

Sydney Region

Meeting held at Cumberland State Forest, NSW, on 14 February 1998

Patrick Medway, Illawarra Zoological Society

Some 25 members enjoyed a great day in the Cumberland State Forest, West Pennant Hills, and learned about the NSW State Forests' extensive conservation program.

Welcomed by Leanne Haywood, we heard about the way they are managing the 3.4 million hectares of forests covering a wide range including rainforests, open forests, hardwood and softwood plantations throughout NSW. State Forests are public assets and are being used by a wide variety of competing interest groups including graziers, four wheel drivers, bee keepers, campers, bushwalkers and timber producers. There are also aboriginal archaeological sites.

The State Forest Research Station at West Pennant Hills has some 70 staff working on more than 100 projects. Many of the successful projects have resulted in better trees and shrubs which are available in the nursery.

Cumberland State Forest was originally an orange grove and farm. It has become a wonderful forest haven on the edge of a big city where birds, animals and plants safely co-exist with many human visitors each day. One of the special features of the Forest is

the Arboretum, with some 250 different types of trees planted out. We were most impressed with the fine stands of eucalyptus trees throughout the grounds. The Flooded Gums (Ed. *Eucalyptus grandis*) planted in the 1940s now reach some 25-30 metres high, along with the Bunya Pines (Ed. *Araucaria bidwillii*) with their huge seed pods dropping around as we walked through the forest pathway.

We learned of the conservation surveys, community volunteer ranger program, the timber harvesting policy, the National Forest Policy statement, selective cutting and genetic diversity programs, with much healthy discussion following the address.

The Conservation Policy covered the Flora Reserve System - dedicated areas for rare and threatened species; filter strips - 20-30 m reserves each side of creeks and rivers to form wildlife corridors which are very important for conservation of all wildlife; old growth forests - preservation of genetic diversity and natural homes for much of our wildlife; Comprehensive Reserve Systems - 15% of each type of habitat being preserved in reserves, and value added timber industry.

The reorganised State Forests include the Softwood Division with some 200,000 hectares under plantation, mainly Radiata Pine; the Hardwood Division for major State forests; the Natural Forests Regional Division; Harvesting Advisory Board; the Joint Venture Program involving both public and private landowners planting out

eucalypt trees for future harvesting, and the 'Trees on Farms' program.

After the address we went on an extensive walk through the forest looking at and identifying the rich variety of trees and plants growing so healthily throughout the grounds before returning to the barbecue area for lunch. Following lunch members met for a planning meeting for the next visitation program. We agreed to recommend a visit in early spring 1998 to Katandra Trust property at Ingleside near Mona Vale where there is a fine collection of rare and threatened species of plants. Another suggestion was a visit to the Castlereagh State Forest and to the Munmorah State Recreation Area in August-September.

Next Meeting

Venue: The Rare and Threatened Species bed, Royal Botanic Gardens, Sydney.

Date: May 1998.

For further information, contact the Coordinator, Tracey Armstrong, Mt Annan Botanic Garden, Mt Annan NSW 2567.

Phone: 02 4648 2477;

Fax: 02 4648 2465;

Email: tracey@rbgsyd.gov.au



NSW South West Slopes Region

Paul Scannell, Albury Botanic Gardens

We have some great developments coming up this year in our region, and things are starting to fall into place for plant conservation.

We had a visit from members of the Threatened Species Unit of NSW National Parks and Wildlife looking at the site of *Caladenia concolor* (Crimson Spider Orchid), and our local orchid enthusiast was able to show them a new southern recording for *Dipodium hamiltonianum* (Yellow Hyacinth Orchid) in the same area.

A network of seedbanks looks like springing up over the next 12 months, at sites including Griffith, Wagga Wagga, Echuca, Albury and Mildura. This network is the result of a lot of background work from Greening Australia, the Murray Catchment Management Committee (Working Group) and local groups. The curators' positions are being advertised currently and enquiries can be made to Martin Driver, Greening Australia, Deniliquin. (Ed. The closing date was 13 March 1998, but you may still wish to phone Martin in case there were not enough applicants, or with any other queries.)

These seedbanks are to enable direct seeding projects to get off the ground next spring and many people have been busy collecting seed from their properties. The seedbanks may also develop as Bushcare and Landcare Resource Centres, and the job

descriptions mention educating local groups about collecting, storing, and growing seed.

Best practice guideline manuals will be made available in user friendly form.

The Along the Bushtracks booklet, explaining some of the flora, fauna and walking trails of Albury-Wodonga has proven very popular. The Albury Botanic Gardens will be producing a video this year on the flora and fauna of this area, using some magnificent shots from one of our local enthusiasts. The video will be both educational and entertaining and aimed at younger audiences, with appropriate messages.

Everyone's really busy in our area preparing submissions for funding from the Natural Heritage Trust, so if anyone needs some advice, contact me, Paul, at the Botanic Gardens, to find the best person to speak to.

Projects are extremely varied this year, with revegetation, research, mapping and resources all being looked at in a well coordinated regional context. This will provide some very positive outcomes for plant conservation in our region.

All the best for 1998.

Coordinator: Paul Scannell,
Albury Botanic Gardens,
PO Box 323, Albury NSW 2640.
Phone: 02 6023 8241;
Fax: 02 6041 6527.



NSW Western Slopes Region

Report of the meeting held on 7 February 1998

Neil Bollinger, Orange Botanic Gardens

For the first field trip of the year for the ANPC Western Slopes group, 20 people made up of locals as well as people who travelled some distance, met at the Clover Hill Centre at the Orange Botanic Gardens.

The day started at 10 am with morning tea, provided by the Friends, with people catching up with news since the last gathering and general discussion on the next few field trips. It was decided to head east to Jocelyn Bishop's land of native vegetation on May 9 for the next field trip. The Bumberry Ranges where a fire occurred recently would be a trip in August, with a trip to Young in October.

Then the day really began, with more discussion, but this time on the history, future direction and issues concerning the Orange Botanic Gardens. After all had been said it was off for a walk around the 17 ha Gardens, looking at both past and future projects. Also time was taken to look at some of the vegetation growing.

After almost two hours of walking in hot temperatures, lunch was taken and fluids were replaced. Then with everyone refreshed, it was time for the guest speaker, Mr Lloyd Kingham, Senior Facilitator of Farming for the Future, NSW Agriculture, Wagga, to take the floor.

Lloyd presented a paper on "Ecological Principles and the Business World" which was to be only 40 minutes in length but lasted for several hours due to the questions! This meant that the planned trip to Mt Canobolas was postponed for another day.

So until next time - keep Australia growing native plants.

Ed. Neil sent a copy of Lloyd Kingham's talk to us. It's too long to reprint here, but is very interesting. If you'd like a copy please contact the National Office.

Next Meeting

Venue: Jocelyn Bishop's land, 'Bundari' at Perthville, NSW.

Date: 9 May 1998.

For further information, contact Bob Waters at Burrendong Arboretum. **Phone:** 02 6846 7454.

SENSW/ACT Region

On 9 February the SENSW/ACT Region group held a seminar given by Christopher Willis, the Coordinator of the Southern African Botanical Diversity Network (SABONET).

Christopher gave an overview of southern Africa and talked about the Network.

SABONET covers the ten countries of South Africa. ie. Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe. It aims to develop a strong core of professional botanists, taxonomists, horticulturists and plant diversity specialists within the ten countries. This will enable

them to competently carry out inventories, monitor, evaluate and conserve the botanical diversity of the region in the face of specific development challenges, and to respond to the technical and scientific needs of the Convention on Biological Diversity. Emphasis is on the development of staff attached to national herbaria and botanic gardens in southern Africa.

In addition there was a brief update from Jeanette Mill on ANPC, and on the Action Plans for Protecting ACT's Threatened Species from Sarah Sharp, Senior Plant Ecologist and Grasslands Project Officer, Wildlife Research and Monitoring, Environment ACT.

Members and others then met with Christopher and discussed the Network and other topics.

Contact for information about further meetings in 1998 is the Regional Coordinator, John Wilkes.

Phone: 02 6238 2490;

Email: wilkej@ibm.net

Publications

Restoration of Endangered Species: Conceptual Issues Planning and Implementation. 1994. Eds. M. L. Bowles and C. J. Whelan. Cambridge University Press.

Sampling the Green World: Innovative Concepts of Collection, Preservation and Storage of Plant Diversity. 1996. Eds. T. F. Stuessy and S. H. Sohmer. Columbia University Press, New York.

Motivating people: using management agreements to conserve remnant vegetation. 1997. C. Binning and M. Young. National Research and Development Program on Rehabilitation, Management and Conservation of Remnant Vegetation paper, 1/97. Biodiversity Group, Environment Australia, Canberra.

Plant Genetic Conservation: the In Situ Approach. 1997. Eds. N. Maxted, B. V. Ford-Lloyd and J. G. Hawkes. Chapman & Hall, London.

Assessing the status of threatened plants: a new methodology and an application to the vascular flora of New South Wales. 1997. David A. Keith, Jane M. Chalson and Tony D. Auld. NSW National Parks and Wildlife Service, PO Box 1967, Hurstville, NSW. (Final report, Project no. 450, Commonwealth Endangered Species Program, Environment Australia).

Are there seeds in your wetland?: assessing wetland vegetation. 1997. Margaret Brock. Land & Water Resources Research & Development Corporation, GPO Box 2182, Canberra ACT 2601.

Threatened species of western New South Wales. Fauna section compiled by Dani Ayers, flora section compiled by Sharon Nash and Karen Baggett. 1996. NSW National Parks and Wildlife Service, PO Box 1967, Hurstville, NSW 2220.

**The Australian Network For
Plant Conservation
Membership List**

The date (1996/7/8) indicates that the member has joined or renewed for that year. Addresses and names of contact persons are available from the National Office.

Corporate Members

Adelaide Botanic Gardens (1998)
ACT Parks & Cons. Service (1998)
Albury Botanic Gardens, NSW (1998)
Alcoa of Australia Ltd, WA (1998)
Australian Army (1995)
Australian National Botanic Gardens (1998)
Aust Tree Seed Centre, CSIRO (1998)
Barcaldine Shire Council, Qld (1997)
Biodiversity Group, Environment Australia (1998)
Bremer Inst. of TAFE, Qld (1996)
Caloundra City Council, Qld (1997)
Centre for Plant Biodiv. Rsch, ACT (1998)
Centre for Plant Conservation Genetics, NSW (1998)
Coffs Harbour City Council, NSW (1999)
Conservation & Land Management, WA (1996)
Council of the City of Orange, NSW (1998)
CSIRO Publishing (1998)
Environment ACT (1997)
Eurobodalla Bot Garden, NSW (1997)
Flecker Botanic Gardens, Qld (1999)
Forestry Tasmania (1996)
Gladstone Tondoon Botanic Garden, Qld (1998)
Kings Park and Botanic Gardens, WA (1997)
LWRRDC, ACT (1998)
Logan City Council Libraries, Qld (1998)
Maroochy Shire Council, Qld (1997)
Minerals Council of Aust, ACT (1997)
Mt Coot-tha Botanic Gardens, Qld (1998)
Mt Tomah Botanic Garden, NSW (1998)
Norfolk Island Botanic Garden (1996)
North Forest Products, Tas (1998)
NSW National Parks & Wildlife Service (1999)
Pacific Power, NSW (1998)
Parks and Wildlife Commission, NT (1998)
Parks and Wildlife, Tas (1998)
Qld Dept. Environment Cent. Coast (1998)
Queensland Herbarium (1998)
Randwick City Council, NSW (1998)
RGC Mineral Sands, WA (1998)
Royal Botanic Gardens, Melbourne, Vic (1997)
Royal Botanic Gardens, Sydney, NSW (1999)
Royal Tasmanian Botanical Gardens (1997)
Standing Committee on Forestry, ACT (1995)
Strathfield Municipal Council, NSW (1998)
Townsville City Council, Qld (1998)
Transgrid Yass, NSW (1996)
Wollongong Botanic Gardens (1997)
Zoological Parks Board of NSW (1997)
Zoological Board of Victoria (1998)

International Associates

Auckland Plant Collections Network, NZ
Botanic Gardens Conservation Intl, UK
Botanical Research Institute of Texas
David Brackett, SSC, Canada
Canadian Botanical Conservation Network
Center for Plant Conservation, USA
David Given, NZ
Honiara Botanic Gardens, Solomon Islands
Indian Society for Conservation Biology
Indonesian Network for Plant Conservation
Clive Jermy
Kebun Raya Indonesia
Noelline Kroon, South Africa
Missouri Bot. Gardens Library (1996)
Suresh Narayana, India
National Botanical Institute, South Africa
PlantNet, UK
Rare Plant Consortium, Canada
Royal Botanic Gardens, Kew, UK (1997)
Alison Shapcott, Brunei (1997)
Society for Ecological Restoration, USA
Dr I Wayan Sumantera, Indonesia
Suva Botanical Gardens, Fiji
Roy Taylor, USA (1998)
Andrew Townsend, Dept. Cons., NZ
Vailima Botanic Gardens, Western Samoa
Wellington Plant Conservation Network

Other Organisations

ARAZPA (1998)
Arid Lands Environment Centre, NT (1998)
Assn. of Soc. for Growing Aust Plants (1997)
Australian Arid Land Botanic Garden, SA (1999)
Aust Assn. of Bush Regenerators (1997)
Aust. Inland Botanic Gardens, Vic (1997)
Aust. Trust for Conservation Volunteers (1997)
Brunswick Valley Heritage Park, NSW (1997)
Burnley College, Vic (1997)
Burrendong Arboretum Trust, NSW (1997)
Community Biodiversity Network (1998)
Cotter Parkcare Group, ACT (1996)
Dept. Land & Water Cons, Dubbo NSW (1998)
Friends of Grasslands, ACT (1997)
Friends of North Coast Regional BG, NSW (1998)
Greening Australia (ACT/SENSW) (1999)
Greening Australia Ltd (1998)
Greening Australia (NSW) (1998)
Greening Aust Sth West Plains, NSW (1997)
Greening Aust Sth West Slopes, NSW (1998)
Greening Australia (Vic) (1997)
Greening Western Australia (1996)
Hunter Region Botanic Gardens, NSW (1998)
Illawarra Zoological Society, NSW (1997)
Indigenous Flora & Fauna Assn (1998)
Lismore Rainforest Bot. Garden (1997)
Merri Creek Management C'ttee, Vic (1998)
Myall Park Botanic Garden, Qld (1997)
National Threatened Species Network (1997)
Network of Reg Bot. Gdns, Qld (1996)
NSW Roadside Env't. C'ttee (1998)

Olive Pink Botanic Garden, NT (1998)
Pangarinda Arboretum, SA (1997)
Qld Biodiversity Network, Qld (1998)
Royal Aust Institute of Parks & Recreation (1996)
Royal Geographical Society of Qld (1998)
Royal Zoological Society of SA (1999)
SGAP Blue Mtns Group, NSW (1998)
SGAP - Canberra Region Inc (1998)
SGAP - Dryandra Study Group (1998)
SGAP - Far Nth Coast Gp, NSW (1998)
SGAP - Hobart District Group (1996)
SGAP - Ipswich Branch, Qld (1997)
SGAP - Maroondah Inc, Vic (1998)
SGAP - Newcastle, NSW (1999)
SGAP - New South Wales Ltd. (1998)
SGAP - North Shore, NSW (1998)
SGAP - Northern Group, Tas (1999)
SGAP - North West, Tas (1998)
SGAP - Queensland Region (1998)
SGAP - South West Slopes, NSW (1998)
Stony Range Flora Reserve, NSW (1997)
Sunraysia Oasis Botanical Gardens, Vic (1996)
Tasmanian Arboretum Inc (1997)
Trust for Nature (Victoria) (1998)
Understorey Network, Tasmania (1997)
Wallum Action Group, Qld (1997)
Wildflower Society of WA (1998)
Wildflower Society of WA, Nth Suburbs (1998)
Wildlife Preservation Society (1998)
World Wide Fund for Nature Australia (1998)

Individual Members

Gail Abbott, NSW (1997)
Dr David Aldous, Vic (1998)
Jan Allen, NSW (1997)
Ian Anderson, ACT (1998)
Benjamin Armstrong, NSW (1998)
Margaret Bailey, NSW (1997)
Greg Bain, Vic (1998)
Bee & Bill Barker, Vic (1997)
Clive Barker, NSW (1996)
Tim Barlow, Vic (1999)
Robert Barnes, NSW (1997)
Stephen Barry, Qld (1996)
Douglas Beckers, NSW (1998)
Brett Beecham, WA (1998)
Margaret Bell, NSW (1997)
Stephen Bell, NSW (1997)
John Benson, NSW (1998)
Megan Birmingham, NSW (1996)
Jocelyn Bishop, NSW (1998)
Robert Blackall, NSW (1996)
Dhyan Blore, NSW (1996)
Dr Robert Boden, ACT (1997)
Elizabeth Boesel, NSW (1997)
Dr Barbara Briggs, NSW (1997)
Dr AHD Brown, ACT (1998)
Douglas Brown, Tas (1998)
Louise Bull, NSW (1998)
Dr G Burrows, NSW (1996)
Geoff Butler, NSW, Hon. Life Member
Geoff Carr, Vic (1998)

- Mary Cawte, NSW (1996)
 Calder Chaffey, NSW (1998)
 Irene Champion, Qld (1998)
 Anne Coates, WA (1997)
 Fiona Coates, Vic (1998)
 Anne Cochrane, WA (1998)
 Daniel Cole, NSW (1997)
 Ian Cole, NSW (1998)
 Jon Cole, NSW (1996)
 Ben Correy, NSW (1997)
 Russell and Sharon Costin (1997)
 Jennifer Cowie, NSW (1997)
 Ian Cox, NSW (1998)
 Isobel Crawford, ACT (1997)
 Darren Crayne, NSW (1997)
 Simon Cropper, Vic (1998)
 P. Cruickshank, NSW (1997)
 Louise Cusack, NSW (1996)
 Paul Davies, NSW (1998)
 Richard Davies, SA (1997)
 John Delpratt, Vic (1996)
 Egon Demuth, NSW (1998)
 Michael Doherty, ACT (1997)
 Ross Doig, NSW (1998)
 Stuart Donaldson, ACT (1996)
 Wendy Dossetor, ACT (1997)
 David Duncan, Vic (1998)
 Geoffrey T Edwards, Qld (1997)
 Alison Elvin, ACT (1997)
 Elizabeth Fenton, Vic (1997)
 Paul Field, Vic (1998)
 Donna Fitton, NSW (1998)
 Lance FitzGerald, NSW (1997)
 Paul Foreman, Vic (1998)
 Julie Foster, ACT (1996)
 Bill Gale, WA (1998)
 Elizabeth George, WA (1998)
 Helen Glazebrook, NSW (1997)
 Kaye Glennon, WA (1998)
 Roger Good, ACT (1997)
 Dave Gordon, Qld (1998)
 Dr Janet Gorst, Qld (1998)
 Robert Gourlay, ACT (1997)
 William Grattan, NSW (1998)
 Helen Grey-Smith, WA (1997)
 Barrie Hadlow, ACT (1998)
 Gwen Harden, NSW (1998)
 Bob & Noeline Harris, NSW (1998)
 Roger Hart, Christmas Is. (1997)
 Tim Hayes, NSW (1997)
 Els Hayward, Tas (1999)
 Michael Healey, NSW (1996)
 Garth Hockly, Qld (1998)
 Patricia Hogbin, ACT (1997)
 Keith Holmes, NSW (1997)
 Irene Horneman, Qld (1998)
 Elsie Howe, NSW (1998)
 John T Hunter, NSW (1998)
 Mrs S Hyné, NSW (1996)
 S. Ip, NSW (1997)
 Greg Jackson, NSW (1997)
 Amanda Johnson, NSW (1998)
 Kerry Jones, Vic (1996)
 Morton Kaveney, NSW (1998)
 Kerry Kirk, NSW (1998)
- Van Klaphake, NSW (1998)
 Heather Knowles, Qld (1998)
 Bernie Kocur, NSW (1997)
 Patty Kolln, NSW (1998)
 Jill Landsberg, ACT (1998)
 Peter Lawrence, Qld (1997)
 Gary Leonard, NSW (1999)
 Steven Leuver, NSW (1997)
 Tony Lewis, NSW (1998)
 Gordon Limburg, NSW (1997)
 John Litchfield, ACT (1997)
 Vicki Long, WA (1998)
 Bill McDonald, Qld (1997)
 Tein McDonald, NSW (1997)
 Lori McGarva, NSW (1997)
 Alex Mackenzie, NSW (1997)
 Joanna MacLachlan, NSW (1998)
 Bob Makinson, ACT (1998)
 David Mason, NSW (1997)
 Maria Matthes, NSW (1997)
 Lyn Meredith, ACT, Hon. Life Member
 Adam Merrick, Vic (1997)
 Tammy Mills-Thom, NSW (1998)
 Geoffrey Mitchell, NSW (1997)
 Judith Moffatt, Qld (1996)
 Brian Mole, Vic (1997)
 Rosalind Moore, NSW (1998)
 Lorna Murray, Qld (1997)
 Daphne Nash, ACT (1997)
 Sharon Nash, NSW (1998)
 Robyn Newman, NSW (1996)
 Nan Nicholson, NSW (1998)
 Henry Nix, ACT (1998)
 Brett O'Donovan, NSW (1997)
 Samantha Olson, NSW (1998)
 Joan Overeem, NSW (1997)
 Dr. Bob Parsons, Vic (1998)
 Hugh Paterson & Francoise Matter, NSW (1998)
 Gordon Patrick, NSW (1998)
 Travis Peake, NSW (1997)
 Judy Peet, NSW (1997)
 Ian Perkins, NSW (1997)
 Plantique, NSW (1998)
 J Playford, Qld (1999)
 Tim Powe, ACT (1996)
 Brian Quinn, Vic (1998)
 Frances Quinn, NSW (1996)
 Peter Ray, WA (1998)
 Ruth Readford, NSW (1998)
 Phil Redpath, NSW (1997)
 Dorothy Redreau, WA (1996)
 Borini Reichelt, Qld (1998)
 Mark Richardson, NT Hon. Life Member
 Lill Roberts, Vic (1999)
 Brett Robinson Qld (1997)
 Mark Robinson, NSW (1999)
 Esma Salkin, Vic (1998)
 Sarah Sharp, ACT (1997)
 Mark Sheahan, NSW (1996)
 Ian R Smith, Qld (1997)
 Marilyn Smith, NSW (1997)
 John Smyth, NSW (1997)
 Diana Snape, Vic (1998)
 Fiona Spiers-Ashcroft, ACT (1997)
- Marilyn Sprague, Vic (1997)
 Debbie Stevenson, NSW (1998)
 John & Irene Story, Qld (1998)
 Jonathan Streat, NSW (1998)
 Joe Swartz, NSW Hon. Life Member
 Jane Tarran, NSW (1998)
 Nicki Taws, ACT (1997)
 Technical Librarian, Qld (1998)
 David Tierney, NSW (1998)
 Elaine Thomas, Vic (1998)
 Lyn & Merle Thompson NSW (1997)
 Kylie Treble, Vic (1998)
 Bindi Vanzella, NSW (1997)
 Brenda Venton, NSW (1998)
 Dierk von Behrens, ACT (1997)
 Warner Wait, Tas (1997)
 Josephine Walker, NSW (1997)
 Robert Wallis, Vic (1999)
 Bruce Wannan, Qld (1999)
 Chris Ward, NSW (1997)
 Sylvia Webber, NSW (1997)
 Matt White, Vic (1997)
 John Wilkes/Ros Cornish, NSW (1998)
 Jann Williams, NSW (1999)
 J & A Willinck, NSW (1999)
 Anne-Marie Wilson, ACT (1997)
 Brigitta Wimmer, NSW (1999)
 Geoff Winning, NSW (1998)
 Carolyn Woods, NSW (1997)
 John Wrigley, NSW (1998)
 Martin Zierholtz, NSW (1997)
 Toive Zoete, NSW (1998)
- Donations Received from:**
 John Benson (1997)
 Julie Foster (1996)
 Bill Gale (1998)
 EA George (1997)
 Janet Gorst (1998)
 S. Ip (1997)
 Gary Leonard (1998)
 Steven Leuver (1997)
 Gordon Limburg (1996)
 A Mackenzie (1997)
 Nan Nicholson (1997)
 Plantique (1997)
 Ruth Readford (1997)
 Martin Zierholtz (1997)